



Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

Northeast Regional Office • 205B Lowell Street, Wilmington MA 01887 • 978-694-3200

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December 22, 2015

Mr. John Hanselman
Hadley AD 1, LLC
20 Walnut Street, Suite 308
Wellesley, MA 02481

RE: HADLEY
Transmittal No.: X257672
Application No.: NE-13-024
Class: *SM-25*
FMF No.: 521599
AIR QUALITY PLAN APPROVAL

Dear Mr. Hanselman:

The Massachusetts Department of Environmental Protection (MassDEP), Bureau of Waste Prevention, has reviewed your Non-major Comprehensive Plan Application (Application) listed above. This Application concerns the approval of an anaerobic gas digestion system, an associated engine, and an enclosed flare at Barstow's Longview Farm located at 14 Barstow Lane in Hadley, Massachusetts (Facility). The Application bears the seal and signature of Michael T. Lannan, Massachusetts Registered Professional Engineer number 45607.

This Application was submitted in accordance with 310 CMR 7.02 Plan Approval and Emission Limitations as contained in 310 CMR 7.00 "Air Pollution Control," regulations adopted by MassDEP pursuant to the authority granted by Massachusetts General Laws, Chapter 111, Section 142 A-J, Chapter 21C, Section 4 and 6, and Chapter 21E, Section 6. MassDEP's review of your Application has been limited to air pollution control regulation compliance and does not relieve you of the obligation to comply with any other regulatory requirements.

MassDEP has determined that the Application is administratively and technically complete and that the Application is in conformance with the Air Pollution Control regulations and current air pollution control engineering practice, and hereby grants this **Plan Approval** for said Application, as submitted, subject to the conditions listed below.

Please review the entire Plan Approval, as it stipulates the conditions with which the Facility owner/operator (Permittee) must comply in order for the Facility to be operated in compliance with this Plan Approval.

1. DESCRIPTION OF FACILITY AND APPLICATION

Barstow's Longview Farm is located in Hadley, Massachusetts and produces raw milk for wholesale distribution to cooperative processing facilities. The farm has approximately 250 cows. The farm also includes 400 acres of land for crops.

Hadley AD 1, LLC (the Permittee) has installed an anaerobic digestion/biogas-to-energy system (the "Facility"), which consists of a 300 kilowatt (kW) biogas-fired combined heat and power engine/generator set, a back-up enclosed flare, and an anaerobic digestion system at Barstow's Longview Farm. The biogas is used to produce electricity and heat via the lean burn engine. The heat is used by the Facility while the electricity is used by the Facility and the farm as well as supplied to the electric grid.

The Facility combines the in-house cow manure with leftover food and other Source Separated Organic (SSO) materials generated in the greater Boston metropolitan area to produce biogas. The SSO is collected and homogenized at a separate pre-processing facility and delivered to the farm as a liquid slurry.

RCM International, LLC constructed the anaerobic digestion system at the Facility. The digestion system accepts up to 100 wet tons of biomass (consisting of cow manure and SSO materials) per day with a total solids content of between 10 and 15 percent by weight. Operating under this scenario, the plant can generate up to 300 kilowatts per hour (kWh) of electricity and convert 85 percent (%) of the system's potential biogas to useable energy.

The anaerobic digestion/biogas-to-energy system includes the following emission units (EUs): a cow manure tank, two (2) Feedstock Tanks, a Digester Tank, an Effluent Tank, two (2) Liquid Fertilizer Storage Tanks, a lean burn engine/generator set, a back-up enclosed flare, and a Supervisory Control and Data Acquisition (SCADA) system.

Cow Manure and Feedstock Tanks

Liquid SSO derived feedstock is delivered to the site in up to 9,000-gallon tanker trucks. The SSO is gravity fed into one of two Feedstock Tanks, designated as Emission Units 4 and 4A (EU4 and EU4A).

The SSO is heated before it is transferred to the 575,000-gallon Digester Tank (EU5). Cow manure from the 10,000-gallon Cow Manure Tank (EU3) is transferred directly into EU5.

Air in the headspace of the two Feedstock Tanks passes through a pollution control device (PCD) which consists of two activated carbon drums in series (PCD1) to remove potential odors as the headspace air is displaced during filling operations. Sample ports exist at the inlet

and outlet of the carbon drums. Odor will be monitored and a new carbon drum will be placed at the back end of the control device while the second drum in the series replaces the first drum when the outlet of the first drum reaches 5 parts per million as detected by a sorbent tube.

EU4 and EU4A are rectangular insulated, cast in place concrete tanks that have a maximum capacity of 50,000 gallons and 18,000 gallons, respectively. EU4 is approximately 34 feet long by 20 feet wide by 12 feet deep. EU4A is approximately 12 feet long by 20 feet wide by 12 feet deep. Both tanks have an operating depth of 10 feet. A prop mixer is utilized in each tank to prevent the stratification of material, ensuring a consistent mix for feeding to the Digester Tank (described below). Both EU4 and EU4A have a gas tight wooden roof. These two feedstock tanks can provide a hydraulic storage buffer of up to 7 days of capacity for the Digester Tank. Biomass from EU4 and EU4A will be periodically supplied to the Digester Tank so as to maintain the required solids/liquids/nutrients ratios in the Digester Tank.

Digester Tank

The Digester Tank (EU5) provides the mean hydraulic retention time (approximately 33 days) necessary to allow methanogenic bacteria to convert approximately 48% of the organic biomass into biogas. The material in EU5, called digestate, will be heated to maintain an ideal temperature of approximately 100 degrees Fahrenheit ($^{\circ}\text{F}$). The actual EU5 temperature will be maintained at approximately 90 - 100 $^{\circ}\text{F}$ via a heat exchanger using waste heat from the proposed engine/generator for optimal digestion.

EU5 is an insulated, cast in place concrete tank with a working volume of 525,000 gallons with an 80 foot diameter and 16 feet in depth. The operating depth for the tank is 14 feet. Three (3) prop mixers prevent stratification of any material inside EU5, ensuring a consistent mix. The conditioned biomass from EU3, EU4, and EU4A is fed into EU5 at a turbulence zone created by the mixer to minimize the time required to obtain a complete mix.

Biogas storage in EU5 occurs within the single membrane roof system that inflates and deflates according to the amount of biogas in the system. Safe pressure levels are maintained by a water trap mounted to EU5 that allows gas to release if the gas pressure is greater than 0.9 inches water column ("wc) or 0.08" wc negative pressure.

To support the process of biologically oxidizing hydrogen sulfide (H_2S) with aerobic bacteria, small amounts of air are introduced into the headspace of EU5 (or the fixed film canister) at a rate of 4 – 8% of gas production. The actual dosage rate is controlled by the amount of oxygen measured in the cleaned biogas so that it is maintained between 0.5 and 4% by volume. Oxygen is only added once methane concentrations are approaching equilibrium. Until then, oxygen from the headspace of EU5 and simple, oxygen-containing compounds in the food source, such as fatty acids and aldehydes, can supply the necessary oxygen.

Two biological scrubbing vessels (PCD2) and one iron sponge hydrogen sulfide removal system (PCD3) provide additional H₂S control to maintain the H₂S concentration below 200 parts per million by volume (ppmv), prior to the combustion of the biogas in either the lean burn engine or the back-up enclosed flare.

PCD2 contains aerobic sulfur oxidation bacteria which grow on plastic packing material. Biogas is conveyed through the vessels in series to oxidize H₂S into elementary sulfur and sulfuric acid. Wash down water is continuously re-circulated through the biological scrubbers to knock off accumulated precipitated sulfur from the packing material. The wash down water is replaced every 2 months, and discharged to one of the two slurrystore tanks along with digestate.

After the biological scrubbers, the biogas passes through PCD3 to further remove H₂S. In the iron sponge scrubber, H₂S binds with ferric oxide in the media removing it from the biogas stream.

The H₂S level is monitored weekly at the outlet of PCD3. When the H₂S level is observed to be consistently rising, the treatment efficiency of the biological scrubbers and the iron sponge scrubber will be monitored by checking the inlet and outlet H₂S concentrations. The media in the biological scrubber does not need to be replaced, as it is plastic and should not degrade over time, but the surface of the media should be flushed with water every two years to remove sulfur that has built up on the media. The iron sponge media will be completely replaced every three to five years, or as necessary.

Effluent Management System

Effluent leaving EU5 flows by gravity over a weir into the 20,000-gallon Effluent Tank (EU6) for short term storage of 1 – 2 days. From EU6, effluent is pumped periodically into one of two 1,000,000-gallon Liquid Fertilizer Storage Tanks (EU6 and EU6A).

Lean burn Engine and Back-up Enclosed Flare

Biogas from EU5 serves as fuel for the Guascor Model No. SFGLD 240 engine. The biogas contains approximately 607 British thermal units per standard cubic foot (Btu/scf) of gas. The methane concentration in the biogas is expected to be about 60% by volume. A back-up enclosed flare combusts the biogas whenever the engine is down for maintenance.

The Guascor Model No. SFGLD 240 engine (EU1), has a maximum heat input capacity of 4,070,000 British thermal units per hour (Btu/hr). EU1 is capable of combusting up to 84 standard cubic feet per minute (scfm) of digester gas at 100% load. It will be equipped with an 8-inch diameter vertical exhaust stack. The opening of this vertical stack is situated 16 feet above the engine enclosure and 27 feet above ground level. The exhaust gas exit velocity from

EU1 will range from 36 to 78 feet per second at a stack gas temperature of approximately 290 degrees Fahrenheit (°F).

The back-up enclosed flare (EU2) has a maximum heat input capacity of 7,280,000 Btu/hr. EU2 is capable of combusting up to 200 scfm of digester gas with a turndown ration of 10:1. EU2 is equipped with a 30-inch diameter vertical exhaust, the top of which is situated 20 feet above ground level. The exhaust gas exit velocity from the flare will range from 7 to 68 feet per second at a stack gas temperature of approximately 1,200 °F.

SCADA System

The Supervisory Control and Data Acquisition (SCADA) system monitors process control parameters such as digester temperature, digester gas biogas pressure, mixer on/off, pumps, control of heating zones in heat exchanger, and output generation from the engine/generator set in addition to being capable of controlling all system functions by operators that can remotely access the SCADA system via the internet. The SCADA system as well as the process tanks, effluent management system, and biogas processing equipment (i.e., engine, enclosed flare) will be serviced by local technicians in the area. A full inventory of spare parts for the entire facility will be kept at an offsite location within two hours of the facility.

2. EMISSION UNIT (EU) IDENTIFICATION

Each Emission Unit (EU) identified in Table 1 is subject to and regulated by this Plan Approval:

Table 1			
EU#	Description	Design Capacity	Pollution Control Device (PCD)
EU1	Guascor Model No. SFGLD-240 engine	4.07 MMBtu/hr 300 kw max output	Fuel Injection modification; turbocharging
EU2	Back-up enclosed flare	7.3 MMBtu/hr	None
EU3	Cow Manure Tank	10,000 gallons	
EU4	Feedstock Tank	50,000 gallons	
EU4A	Feedstock Tank	18,000 gallons	Two (2) 55-gallon Activated Carbon Drums in series (PCD1)
EU5	Digester Tank	575,000 gallons	Biological Scrubbers (PCD2) and Iron Sponge H ₂ S Control System (PCD3)
EU6	Effluent Transfer Tank	20,000 gallons	None
EU7 EU7A	Two Liquid Fertilizer Storage Tanks	1,000,000 gallons each	None

Table 1 Key:

EU# = Emission Unit Number

PCD = Pollution Control Device

MMBtu/hr = million British Thermal Units per hour

kw = kilowatts

max = maximum

H₂S = hydrogen sulfide

3. APPLICABLE REQUIREMENTS

A. OPERATIONAL, PRODUCTION and EMISSION LIMITS

The Permittee is subject to, and shall not exceed the Operational, Production, and Emission Limits as contained in Table 2 below:

Table 2			
EU#	Operational / Production Limit	Air Contaminant	Emission Limit
EU1 ^a	NA	NO _x	2.0 lbs/MW-hr 0.3 TPM 3.5 TPY
		CO	6.0 lbs/MW-hr 0.88 TPM 10.5 TPY
		VOC	2.4 lbs/MW-hr 0.35 TPM 4.1 TPY
		PM/PM ₁₀ /PM _{2.5}	0.3 lb/MW-hr 0.05 TPM 0.54 TPY
		SO ₂	0.55 lb/MW-hr 0.08 TPM 0.96 TPY
		CO ₂	2415 lbs/MW-hr 270 TPM 3173 TPY
	Daily average of H ₂ S shall be less than or equal to 200 ppmv ^b	H ₂ S	NA
	NA	Opacity	<5%, EXCEPT 5 TO <10% FOR ≤2 MINUTES DURING ANY ONE HOUR
		Smoke	310 CMR 7.06(1)(a)

Table 2			
EU#	Operational / Production Limit	Air Contaminant	Emission Limit
EU2 ^b	Maximum operation of 876 hours per twelve month consecutive period	NO _x	0.5 lb/hr 0.07 TPM 0.22 TPY
		CO	4.8 lbs/hr 0.7 TPM 2.1 TPY
		VOC	1.0 lb/hr 0.15 TPM 0.45 TPY
		PM/PM ₁₀ /PM _{2.5}	0.07 lb/hr 0.01 TPM 0.03 TPY
		SO ₂	0.4 lb/hr 0.06 TPM 0.18 TPY
		CO ₂	1455 lbs/hr 213 TPM 637 TPY
EU2 ^b	Daily average of H ₂ S shall be less than or equal to 200 ppmv ^b	H ₂ S	NA
		Opacity	<5%, EXCEPT 5 TO <10% FOR ≤2 MINUTES DURING ANY ONE HOUR
		Smoke	310 CMR 7.06(1)(a)
Facility-wide	NA	NO _x	0.37 TPM 3.72 TPY
		CO	1.58 TPM 12.6 TPY
		VOC	0.5 TPM 4.55 TPY
		PM/PM ₁₀ /PM _{2.5}	0.06 TPM 0.57 TPY
		SO ₂	0.14 TPM 1.14 TPY
		CO ₂	511 TPM 4205 TPY
		H ₂ S ³	NA

Table 2 Key:

NA = Not Applicable
EU# = Emission Unit Number
NO_x = Nitrogen Oxides
CO = Carbon Monoxide

SO₂ = Sulfur Dioxide
PM = Total Particulate Matter
PM₁₀ = Particulate Matter less than or equal to 10 microns in diameter
PM_{2.5} = Particulate Matter less than or equal to 2.5 microns in diameter
VOC = Volatile Organic Compounds
CO₂ = Carbon Dioxide
lbs/MW-hr = pounds per megawatt hour
lbs/hr = pounds per hour
TPM = tons per month
TPY = tons per consecutive 12-month period
ppmv = parts per million by volume
% = percent
< = less than
≤ = less than or equal to

Notes:

^a These emission limitations shall apply to all engine/generator loads.

Compliance with these emission limitations shall be determined based on one-hour averages.

These emission limits are based upon biogas containing 607 British thermal units per standard cubic foot.

^b H₂S emissions are regulated by restricting the inlet H₂S concentrations to the engine and back-up enclosed flare to less than or equal to 200 ppm_v. SO₂ emissions are based upon 99.5 percent oxidation of the inlet H₂S concentrations.

B. COMPLIANCE DEMONSTRATION

The Permittee is subject to, and shall comply with, the monitoring, testing, record keeping, and reporting requirements as contained in Tables 3, 4, and 5 below:

Table 3	
EU#	Monitoring and Testing Requirements
EU1 EU2 EU3 EU4 EU4A EU5	1. The Permittee shall conduct a noise survey (during daytime and nighttime operation), which is in accordance with MassDEP guidelines, to demonstrate that the noise impacts from the operation of these EUs are in compliance with Regulation 310 CMR 7.10 and the Bureau of Waste Prevention's Noise Policy No. 90-001 (copy attached). This survey shall be conducted within 45 days of the commencement of continuous operation of these EUs. The noise survey results shall be submitted to MassDEP's Northeast Regional Office (NERO), in writing, attention BWP Permit Chief, within 75 days of the commencement of continuous operation of these EUs.

Table 3	
EU#	Monitoring and Testing Requirements
EU1	2. The Permittee shall conduct emissions testing for NO _x , CO, H ₂ S, VOC, SO ₂ , and CO ₂ within 90 days of the commencement of continuous operation of the engine. An additional emissions test shall be conducted by no later than (3 years from initial emissions test). All compliance testing shall be conducted in accordance with the test methods and procedures set forth in 40 CFR 60, Appendix A. All compliance testing shall be witnessed by MassDEP personnel at a mutually agreeable date and time. The Permittee shall submit a test protocol for the required emission test for review and MassDEP approval at least 30 days prior to the anticipated date of testing. The Permittee shall submit the emission test results report to MassDEP's WERO within 60 days of completion of the compliance stack testing.
	3. For compliance testing purposes, this EU shall be constructed so as to accommodate the emissions testing requirements as stipulated in 40 CFR Part 60, Appendix A. The two (2) inlet and two (2) outlet sampling ports should ideally be located at two duct diameters upstream and eight duct diameters downstream of any flow disturbance. The corresponding sampling ports should be 90 degrees apart from each other.
EU1 EU2	4. The Permittee shall monitor the daily, monthly, and twelve month rolling biogas consumption for EU1 and EU2 and the electrical output for EU1 to document compliance with the emission limitations contained in Table 2 above.
EU1 EU2 EU5	5. The Permittee shall monitor weekly the hydrogen sulfide concentration (in ppm by volume) exiting EU5 before the biogas is combusted in either EU1 or EU2 to document compliance with the emission limitations contained in Table 2 above.
EU4 EU4A	6. The Permittee shall monitor daily the amount of SSO that EU4 and EU4 A receives.
	7. The Permittee personnel shall be trained in the proper operation of the activated carbon system for EU4 and EU4 A.
EU4 EU4A	8. The Permittee shall monitor the activated carbon drums (PCD1) for breakthrough on a weekly basis. When breakthrough of greater than 5 parts per million (ppm) of hydrogen sulfide has occurred, the Permittee shall immediately install a new activated carbon drum at the end of the system and replace the first drum with the second drum that was in series.
EU5	9. The Permittee shall monitor the oxygen (O ₂) content weekly in EU5 so that the amount of O ₂ measured in the cleaned biogas can average between 0.5 and 4% by volume.
Facility-wide	10. The Permittee shall conduct additional emissions testing on the subject units if and when MassDEP deems it necessary as per 310 CMR 7.13 – Stack Testing. All emissions testing shall be performed in accordance with USEPA Reference Test Methods and regulation 310 CMR 7.13.

Table 3 Key:

EU# = Emission Unit Number

SSO = source separated organics (i.e. food waste)

O₂ = oxygen

ppm = parts per million

CMR= Code of Massachusetts Regulations

% = percent

Table 4	
EU#	Record Keeping Requirements
EU1 EU2 EU3 EU4 EU4A EU5	<ol style="list-style-type: none"> 1. The Permittee shall quantify all periods of excess emissions, even if attributable to an emergency/malfunction, startup/shutdown or equipment cleaning in the determination of annual emissions and compliance with the emission limits as stated in Table 2. 2. The Permittee shall maintain a record keeping system for these EUs to be established on-site. All such records shall be maintained up-to-date such that year-to-date information is readily available for MassDEP examination upon request and shall be kept on site for a minimum of five (5) years. Record keeping shall, at a minimum, include: <ol style="list-style-type: none"> a) Compliance records sufficient to document the actual monthly and twelve month rolling emission rates of NO_x, CO, VOC, total PM, SO₂, H₂S, and CO₂ from each EU, so as to determine compliance status with the emission limitations contained in Table 2 above. Such records shall include, but are not limited to, the daily, monthly, and twelve month rolling biogas consumption rates for each applicable EU, electrical output for EU1, emissions test results, monitoring equipment data and reports, and hours of operation. b) Maintenance: A record of routine maintenance activities performed on these EUs and their monitoring equipment including, at a minimum, the type or a description of the maintenance performed and the date and time the work was completed. c) Malfunctions: A record of all malfunctions of these EUs and their monitoring equipment including, at a minimum: the date and time the malfunction occurred; a description of the malfunction and the corrective action taken; the date and time corrective actions were initiated; and the date and time corrective actions were completed and the equipment was returned to compliance.
EU1 EU2	<ol style="list-style-type: none"> 3. The Permittee shall maintain records on-site of the daily, monthly, and twelve month rolling biogas consumption for EU1 and EU2 and the electrical output for EU1 to document compliance with the emission limitations contained in Table 2 above.
EU1 EU2 EU5	<ol style="list-style-type: none"> 4. The Permittee shall maintain daily on-site records of the maximum, minimum, and average hydrogen sulfide concentrations (in ppm by volume) exiting EU5 before the biogas is combusted in either EU1 or EU2 to document compliance status with the emission limitations contained in Table 2 above.
EU4 EU4A	<ol style="list-style-type: none"> 5. The Permittee shall maintain daily records on-site of the amount of SSO that EU4 and EU4A receive. 6. The Permittee personnel shall record the date, time, and delivery amount of SSO in a logbook, or similar record keeping system, that shall be maintained near EU4 and EU4A. 7. The Permittee shall maintain weekly records on-site on the condition of the activated carbon system and install a fresh second drum of activated carbon when breakthrough has occurred.
EU5	<ol style="list-style-type: none"> 8. The Permittee shall maintain weekly records on-site on the oxygen (O₂) content in EU5 so that the amount of O₂ measured in the cleaned biogas is maintained between 0.5 and 4% by volume.

Table 4	
EU#	Record Keeping Requirements
Facility-wide	9. The Permittee shall maintain adequate records on-site to demonstrate compliance status with all operational, production, and emission limits contained in Table 2 above. Records shall also include the actual emissions of air contaminant(s) emitted for each calendar month and for each consecutive twelve month period (current month plus prior eleven months). These records shall be compiled no later than the 15 th day following each month. An electronic version of the MassDEP approved record keeping form, in Microsoft Excel format, can be downloaded at http://www.mass.gov/dep/air/approvals/aqforms.htm#report .
	10. The Permittee shall maintain records of monitoring and testing as required by Table 3.
	11. The Permittee shall maintain a copy of all noise survey results on-site
	12. The Permittee shall maintain a copy of this Plan Approval, underlying Application and the most up-to-date SOMP for the EUs and PCDs approved herein on-site.
	13. The Permittee shall maintain records required by this Plan Approval on-site for a minimum of five (5) years.
	14. The Permittee shall make records required by this Plan Approval available to MassDEP and USEPA personnel upon request.

Table 4 Key:

EU# = Emission Unit Number

PCDs = Pollution Control Devices

SOMP = Standard Operating and Maintenance Procedure

USEPA = United States Environmental Protection Agency

% = percent

Table 5	
EU#	Reporting Requirements
EU1	1. The Permittee shall submit a compliance test protocol on the required initial compliance test to MassDEP's Northeast Regional Office (NERO) for review and approval at least 30 days prior to the scheduled commencement of said testing. Test protocols for any subsequent required emissions testing shall be submitted to MassDEP's Western Regional Office (WERO) for review and approval at least 30 days prior to the scheduled commencement of said testing.
	2. The Permittee shall submit the initial emission test results report to NERO for review within 60 days of the completion of any required compliance stack testing. Subsequent emission test results shall be submitted to WERO.

Table 5	
EU#	Reporting Requirements
EU1 EU2 EU3 EU4 EU4A EU5	3. The noise survey results shall be submitted to NERO, in writing, attention BWP Permit Chief, within 75 days of the commencement of continuous operation of these EUs.
	4. The Permittee shall submit the Final Standard Operating and Maintenance Procedures (SOMP) for these EUs to NERO within 60 days of completion of their required initial compliance testing. Any subsequent changes to the SOMP shall be submitted to WERO, within 15 days of said revision(s).
	5. The Permittee shall notify MassDEP's WERO by telephone, fax, or email as soon as possible, but in any case no later than three (3) business days, and subsequently in writing within seven days, after the occurrence of any upsets or malfunctions to these EUs and related equipment which results in an excess emission to the air and/or a condition of air pollution.
	6. All notifications and reporting required and not specified by this Approval shall be made to: Department of Environmental Protection/Bureau of Waste Prevention 436 Dwight Street Springfield, Massachusetts 01103 ATTN: BWP Permit Chief Phone: 413-784-1100 Fax: 413-784-1149
EU1 EU2 EU5	7. The Permittee shall notify MassDEP's WERO, ATTN: BWP Permit Chief, within three (3) business days by fax at (413) 784-1149 of any exceedances of the H ₂ S emission limit found in Table 2 above. In the same manner, the Permittee shall notify MassDEP whenever the H ₂ S gas monitoring probe is offline and again when it is back on-line.
Facility-wide	8. The Permittee shall submit to MassDEP all information required by this Plan Approval over the signature of a "Responsible Official" as defined in 310 CMR 7.00 and shall include the Certification statement as provided in 310 CMR 7.01(2)(c).
	9. The Permittee shall notify MassDEP's WERO, BWP Permit Chief by telephone (413-784-1100), email, Marc.simpson@state.ma.us, or fax (413-784-1149), as soon as possible, but no later than one (1) business day after discovery of an exceedance(s) of Table 2 requirements. A written report shall be submitted to Permit Chief at MassDEP within three (3) business days thereafter and shall include: identification of exceedance(s), duration of exceedance(s), reason for the exceedance(s), corrective actions taken, and action plan to prevent future exceedance(s).
	10. The Permittee shall provide a copy to MassDEP of any record required to be maintained by this Plan Approval within 30-days from MassDEP's written request.

Table 5 Key:

EU# = Emission Unit Number

H₂S = hydrogen sulfide

4. **SPECIAL TERMS AND CONDITIONS**

The Permittee is subject to, and shall comply with, the following special terms and conditions:

- A. The Permittee shall comply with the Special Terms and Conditions as contained in Table 6 below:

Table 6	
EU#	Special Terms and Conditions
EU1	1. EU1 shall be equipped with a critical grade silencer. In addition, the Permittee shall install acoustic noise suppression for the air intake louvers to minimize the potential of a pure tone condition.
EU2	2. The Permittee shall provide raptor protection at the enclosed flare exit.
EU1 EU2	3. The Permittee shall properly operate and maintain PCD2 and PCD3 for the purpose of maintaining the H ₂ S concentration below 200 parts per million by volume (ppmv) prior to the combustion of the biogas in these EUs.
EU4 EU4A	4. The Permittee shall properly operate and maintain PCD1 for the purpose of controlling odors from material handling and processing in these EUs. If the Permittee determines that the breakthrough of the first carbon drum is occurring on a consistent basis, the Permittee may submit this information and request that the weekly schedule of monitoring the first drum be changed to a different testing frequency with the approval of the Western Regional Office of the MassDEP.
EU5	5. The O ₂ content in the cleaned biogas shall average between 0.2 and 4% by volume.
Facility-wide	6. The Permittee shall operate the subject EUs consistent with the Final SOMP and the conditions/parameters established during the initial compliance test.
	7. A full inventory of spare parts for the entire anaerobic digestion Facility shall be kept at an offsite location for use within two hours of the facility.

Table 6	
EU#	Special Terms and Conditions
Facility-wide	<p>8. The Permittee shall submit a standard operations and maintenance plan (SOMP) for the activated carbon system as well as the iron sponge hydrogen sulfide removal system to MassDEP's WERO, ATTN: BWP Permit Chief within sixty (60) days of startup of the Facility. This plan shall be implemented and followed immediately upon startup of the Facility and, at a minimum, include the following information:</p> <ul style="list-style-type: none"> i. A description of each system, including materials of construction and key operating parameter value(s) or range(s); ii. A description of how each said system shall be operated and maintained, including a schedule for routine maintenance and material replacement, equipment specifications of the system's odorous air blower, and dimensions and location of each system; iii. A description of how each system's key operating parameters shall be monitored and corrective actions performed if any key operating parameter(s) fall outside its (their) expected value(s) or range(s); iv. A description of any periodic sampling or testing performed on each system and emissions exiting it for odor-causing compounds; and v. A description of how any system malfunctions shall be reported to the MassDEP.
	<p>9. This Facility may be subject to the Federal New Source Performance Standards (NSPS) for Stationary Spark Ignition Internal Combustion Engines (40 CFR Part 60 Subpart JJJJ). Since MassDEP has not accepted delegation for Subpart JJJJ, you are advised to consult with the EPA for additional information. There may be additional notification, record keeping and reporting requirements. Their address is US EPA Region 1, 5 Post Office Square – Suite 100, Boston, MA 02109-3912.</p>
	<p>10. This Facility may be subject to the Federal National Emissions Standards for Hazardous Air Pollutants (NESHAPs) for Stationary Reciprocating Internal Combustion Engines (RICE) under 40 CFR Part 63 Subpart ZZZZ. This regulation includes stationary RICE units at an area source. Since MassDEP has not accepted delegation for Subpart ZZZZ, you are advised to consult with the United States Environmental Protection Agency (USEPA) for additional information. There may be additional notification, record keeping and reporting requirements. Their address is US EPA Region 1, 5 Post Office Square – Suite 100, Boston, MA 02109-3912.</p>

Table 6 Key:

EU# = Emission Unit Number

O₂ = oxygen

% = percent

PCD2 = two biological scrubbers

PCD3 = iron sponge hydrogen sulfide (H₂S) removal system

- B. The Permittee shall install and use an exhaust stack, as required in Table 7, on each of the Emission Units that is consistent with good air pollution control engineering practice and that discharges so as to not cause or contribute to a condition of air pollution. Each exhaust stack

shall be configured to discharge the gases vertically and shall not be equipped with any part or device that restricts the vertical exhaust flow of the emitted gases, including but not limited to rain protection devices known as “shanty caps” and “egg beaters.” The Permittee shall install and utilize exhaust stacks with the following parameters, as contained in Table 7 below, for the Emission Units that are regulated by this Plan Approval:

Table 7				
EU#/PCD	Stack Height Above Ground (feet)	Stack Inside Exit Dimensions (feet)	Stack Gas Exit Velocity (feet per second)	Stack Gas Exit Temperature (°F)
EU1	27	0.75	49	290
EU2	20	2.5	16	1200

Table 7 Key:

EU# = Emission Unit Number

°F = Degrees Fahrenheit

5. GENERAL CONDITIONS

The Permittee is subject to, and shall comply with, the following general conditions:

- A. Pursuant to 310 CMR 7.01, 7.02, 7.09 and 7.10, should any nuisance condition(s), including but not limited to smoke, dust, odor or noise, occur as the result of the operation of the Facility, then the Permittee shall immediately take appropriate steps including shutdown, if necessary, to abate said nuisance condition(s).
- B. If asbestos remediation/removal will occur as a result of the approved construction, reconstruction, or alteration of this Facility, the Permittee shall ensure that all removal/remediation of asbestos shall be done in accordance with 310 CMR 7.15 in its entirety and 310 CMR 4.00.
- C. If construction or demolition of an industrial, commercial or institutional building will occur as a result of the approved construction, reconstruction, or alteration of this Facility, the Permittee shall ensure that said construction or demolition shall be done in accordance with 310 CMR 7.09(2) and 310 CMR 4.00.
- D. Pursuant to 310 CMR 7.01(2)(b) and 7.02(7)(b), the Permittee shall allow MassDEP and / or USEPA personnel access to the Facility, buildings, and all pertinent records for the purpose of making inspections and surveys, collecting samples, obtaining data, and reviewing records.

- E. This Plan Approval does not negate the responsibility of the Permittee to comply with any other applicable Federal, State, or local regulations now or in the future.
- F. Should there be any differences between the Application and this Plan Approval, the Plan Approval shall govern.
- G. Pursuant to 310 CMR 7.02(3)(k), MassDEP may revoke this Plan Approval if the construction work is not commenced within two years from the date of issuance of this Plan Approval, or if the construction work is suspended for one year or more.
- H. This Plan Approval may be suspended, modified, or revoked by MassDEP if MassDEP determines that any condition or part of this Plan Approval is being violated.
- I. This Plan Approval may be modified or amended when in the opinion of MassDEP such is necessary or appropriate to clarify the Plan Approval conditions or after consideration of a written request by the Permittee to amend the Plan Approval conditions.
- J. Pursuant to 310 CMR 7.01(3) and 7.02(3)(f), the Permittee shall comply with all conditions contained in this Plan Approval. Should there be any differences between provisions contained in the General Conditions and provisions contained elsewhere in the Plan Approval, the latter shall govern.

6. MASSACHUSETTS ENVIRONMENTAL POLICY ACT

MassDEP has determined that the filing of an Environmental Notification Form (ENF) with the Secretary of Energy & Environmental Affairs, for air quality control purposes, was not required prior to this action by MassDEP. Notwithstanding this determination, the Massachusetts Environmental Policy Act (MEPA) and 301 CMR 11.00, Section 11.04, provide certain “Fail-Safe Provisions,” which allow the Secretary to require the filing of an ENF and/or an Environmental Impact Report (EIR) at a later time.

7. APPEAL PROCESS

This Plan Approval is an action of MassDEP. If you are aggrieved by this action, you may request an adjudicatory hearing. A request for a hearing must be made in writing and postmarked within twenty-one (21) days of the date of issuance of this Plan Approval.

Under 310 CMR 1.01(6)(b), the request must state clearly and concisely the facts, which are the grounds for the request, and the relief sought. Additionally, the request must state why the Plan Approval is not consistent with applicable laws and regulations.

The hearing request along with a valid check payable to the Commonwealth of Massachusetts in the amount of one hundred dollars (\$100.00) must be mailed to:

Commonwealth of Massachusetts
Department of Environmental Protection
P.O. Box 4062
Boston, MA 02211

This request will be dismissed if the filing fee is not paid, unless the appellant is exempt or granted a waiver as described below. The filing fee is not required if the appellant is a city or town (or municipal agency), county, or district of the Commonwealth of Massachusetts, or a municipal housing authority.

MassDEP may waive the adjudicatory hearing-filing fee for a person who shows that paying the fee will create an undue financial hardship. A person seeking a waiver must file, together with the hearing request as provided above, an affidavit setting forth the facts believed to support the claim of undue financial hardship.

Enclosed is a stamped approved copy of the application submittal.

Should you have any questions concerning this Plan Approval, please contact Mr. Mun Wong by telephone at 978-694-3286, or in writing at the letterhead address.

Sincerely yours,

This final document copy is being provided to you electronically by the Department of Environmental Protection. A signed copy of this document is on file at the DEP office listed on the letterhead.

Mun S. Wong
Environmental Engineer

This final document copy is being provided to you electronically by the Department of Environmental Protection. A signed copy of this document is on file at the DEP office listed on the letterhead.

Susan P. Ruch
Acting Permit Chief and
Deputy Regional Director
Bureau of Air and Waste

cc: Board of Health, 100 Middle Street, Hadley, MA 01035
Fire Department, 15 East Street, Hadley, MA 01035
MassDEP/Boston - Yi Tian
Vreeland Design Associates, 116 River Road, Leyden, MA 01337 ATTN: David Vreeland
Tech Environmental, 303 Wyman Street, Suite 295, Waltham, MA 02451 ATTN: Michael Lannan
MassDEP/WERO – M. Simpson, S. Motamedi
ecc: E. Braczyk, M. Bolis